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Notes on Odonata of Surinam.

III. The genus Coryphaeschna, with descriptions of a new species and of the nymph of C. virens [1]

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The genus *Coryphaeschna* was proposed by Williamson (1903) on account of differences in the wing venation, found in the species *ingens, virens* and *adnexa* from other species of the genus *Aeschna,* in which genus they were placed before. Calvert (1905) has arranged under this group, beside the three mentioned species, also *luteipennis* and *perrensi,* but under the generic name *Aeschna,* while Martin (1908) included them under *Aeschna.*

Ris (1918) brings together under *Coryphaeschna* also the group *castor,* with the species *castor, januaria* and his new species *coronata.*

Later on Kimmins (1929) describes a new species of *Coryphaeschna* as *longfieldae,* a near relative of *januaria.*

By this, the total number of the known species of *Coryphaeschna* is increased to nine and with the new one described in this paper, the total amounts to ten.

This collection of species forms not a homogenous complex, but a composition of two groups viz: the *virens*-group and the *castor*-group. Each of them is characterized by the wing venation especially. Ris already noted, that *castor* probably represents a different genus, but without further data at hand, we are letting it remain under *Coryphaeschna.*

[1] I. *Rimanella arcana* Needham and its nymph (Odon. Zyg.). *Revista d. Entomologia,* Vol. 11, fasc. 1–2, June 1940, Rio de Jan., pp. 173–179, 8 figs.
II. Six mostly new Zygopterous nymphs from the coastland waters. *Annals, Ent. Soc. America,* XXXIV, no. 4, Dec. 1941, pp. 719–734, 6 figs.

Nymphs of the species of *Coryphaeschna* are known only for *virens* and *ingens,* both belonging to *Coryphaeschna* s.str. How far those of the *castor*-group are different from these the future will show.

By this heterogeneous composition of the genus, it is difficult to give its generic characters. The following peculiarities may generally define the genus in its present form: *Rs* forked under the middle of pterostigma or 1–3 cells before, or at the level of its proximal end. In the fork of *Rs* mostly two cell rows. Between *Rs* and *Rspl* approximately 7 rows of cells (4–8), *Mla* arising from nearly one cell to more than one cell behind the pterostigma. Proximal side of triangle in hind wing usually, but not always (*januaria*), less than half as long as the posterior side. M_4 mostly broken. Anal triangle in male 2-celled, rarely 4–5-celled (*dentata*).

Against these characters, those of the genus *Aeschna* s.str. are as follows: Inner side of triangle of hind wing at least half as long as the outer side. Between *Rs* and *Rspl* at least three rows of cells in its widest part. *Mla* arising from just before to just behind the stigma. M_4 unbroken although more or less sinuate distally. Anal triangle in male mostly 3-celled, rarely 2-celled.

The nymphal characters of *Coryphaeschna* s.str. are: Nymph long and slender, mentum very long, reaching to or below the metacoxae; a long sharp tooth on either side of the mental cleft;[2] rear of head flat, hind angles square-cut; no dorsal hooks, lateral spines on abdominal segments 6–9; superior abdominal appendage not bifid, only slightly longer than the lateral appendages and nearly as long as the inferiors.

Phylogenetically Walker (1912) regarded *Coryphaeschna* as "a lateral offshoot from *Aeschna,* in which the specialization in wing characters has been carried a little farther than in the latter genus" (p. 22).

In its geographical distribution, the genus is confined to the Neotropical region. The *castor*-group occurs in the tropics only, with the exception of *januaria,* which is found also in Mexico;

[2] Known also from *Staurophlebia,* described by Needham (1904).

the species of the *virens*-group, however, live for the most part in the subtropical region and even in the temperate zones North and South of the equator (*ingens* in the U. S. and *perrensi* in Argentina).

The species known from Surinam are: *virens* Ramb., *adnexa* Hagen and *dentata* n.sp., the first two living along the coast in the north, the last one found at the southern border near Brazil. Martin (l.c.) notes also *castor* and *perrensi* from Surinam, but these records are obviously wrong.

luteipennis	Brazil (Rio d. J., S. Paulo), Colombia, Costa Rica, Mexico.
ingens	Panama, Cuba, Bahamas, Florida, Georgia (?).
perrensi	Argentina, Corrientes (Surinam?).
adnexa	Brazil (Amazonia), Colombia, Ecuador, Panama, Honduras, Mexico, Cuba, Haiti, San Domingo, Puerto Rico, Trinidad.
virens	Brazil (Matto Grosso, Amazonia), Bolivia, Surinam, Trinidad, Cuba, Haiti.
januaria	Brazil, Colombia, Mexico.
longfieldae	Brazil (Matto Grosso).
castor	Brazil (Rio d. J., Esp. Santo), (Surinam?).
coronata	Bolivia.
dentata	Surinam.

Key to the species

A. Fork of *Rs* in front and hind wing at the level of the proximal end or under the middle of pterostigma (*virens*-group) 1

1. Thorax green with broad brown bands along the dorsal carina, the humeral and the second lateral sutures, abdomen brown or black for the most part 2

Thorax green, only small brown lines on the sutures 3

2. Stigma in front wing 4 mm.; male superior appendages with a deep subquadrangular incision on the inner margin at three-fourths their length; those of the female very short. Cu_1–Cu_2 with two rows of cells in the proximal part of the field .....*luteipennis* Burmeister

Stigma in front wing 6 mm.; male superior appendages with entire margin; female superior appendages very long .....*ingens* Rambur

3. Frons with a black T-spot, face blue or green 4
Frons without a black T-spot, face reddish, stigma in front wing 4.5–5 mm. .....*perrensi* MacLachl.
4. Smaller species, face blue, hind wing 40–43 mm.; male inferior appendage reaching to ⅔ the superiors. *adnexa* Hagen
Larger species, face green, hind wing 48–54 mm., male inferior reaching to ⅗ the superiors ....*virens* Rambur

B. Fork of *Rs* 1–3 cells proximal to the stigma (*castor*-group) 5

5. Black T-spot on frons absent or incomplete, without stem and with a brown transverse band at the anterior frons angle. Male with last three abdominal segments with paler spots 6
Black T-spot on frons present, with or without stem. Male with last three abdominal segments dark, without paler spots 7
6. Male superior appendages with an infero-basal tooth; abd. 54–58 mm., hdw. 53 mm. .....*januaria* Hagen
Male superior appendages without an infero-basal tooth; abd. 57 mm., hdw. 53 mm. (female unknown). *longfieldae* Kimmins
7. Black T-spot on frons with a rhomboidal stem, connected with the broad basal black line. Male superior appendages with an infero-basal tooth. Pterostigma in hind wing 4 mm., large species .....*castor* Brauer
Black T-spot on frons quadrangular, largely situated on the apical part of frons without stem or any black connection with the narrow basal black line. Male superior appendages without infero-basal tooth, hind tips slightly acute, inferior appendage reaching at least to half length of the superiors. Pterostigma in hind wing 3.5 mm. (female unknown) .....*coronata* Ris
Black T-spot on frons broadly connected with the broad basal dark line. Male superior appendages without infero-basal tooth, hind tips very acute, pointed; inferior appendage short, reaching to one-third length of the superiors. Pterostigma in hind wing 3.5 mm. (female unknown) .....*dentata* n. sp.

Coryphaeschna dentata new species (Figs. 1, A–F.)

Total length incl. app. 72 mm.; abd + app. 56 mm.; app. sup. 6.0 mm.; front wing 50 mm., stigma 4.25 mm.; hind wing 49 mm., stigma 3.5 mm.

A moderately large species, bluish green with the abdomen largely dark.

Labrum, clypeus and frons bluish green with orange yellow margins, mouth-parts brownish at the tips, otherwise pale bluish. Angle of frons black, widely fused by a broad somewhat diffuse stem with the black basal marginal area before the ocelli and the antennal bases; the pale area on each side of the stem yellow brown. Frons beset with soft black hairs, especially along the sides, front margin seen from above arcuated. Occipital triangle black, in the median line from half the length to the hind margin a yellow stripe. Rear of head black, a large pale spot each side behind the eyes in the lower half.

Thorax bluish green before, to green in the hind part with black or dark brown bands along the sutures. The middorsal carina forms the middle line of a black triangle, of which the top reaches the upper suture. Antehumeral stripe blue or bluish green, smaller than the dark humeral stripe, widest in the upper half and reaching to the upper suture line; narrowed below. Black humeral band broad, about two-fifths the width of mesodorsum, a small black stripe along the humeral suture in the upper mesepisternum. Mesipimeron and metepisternum bluish green, a much smaller dark brown line just before the stigma, running from wing base to the end of metepisternum below. Metepimeron green; a short dark brown stripe along the second suture in the upper fourth and a dark line along the suture of the wing base. Legs black, except ventral side of first femur which is largely pale greenish; claws with a well developed tooth halfway the length.

Abdominal segment 1: basal half brown, dorsum with a black triangle, the top reaching the hind margin in the median line; a green postdorsal spot connected with the green of the sides; lateral hind margin black. Segm. 2: dorsum largely black with a green to yellowish middorsal line not reaching the hind margin; dorso-lateral spot yellow, long, just before the latero-transverse carina and ending at the auricle. The dorso-apical spot small, half-moon shaped. Black of dorsum passing along and behind the auricle and obliquely running forward to near

the ventral basal corner of the tergite. Auricle small, green, tip yellow, with three teeth of which the inner tooth is the largest. Sides of segm. 2 green, hind membrane black. Segm. 3–7 largely dark brown or black, dorsum black, behind the transverse carina a medio-dorsal yellow stripe and a rounded small postdorsal spot apically. Sides with a large antero-basal spot, a medio-lateral spot at the carina and a small post-lateral

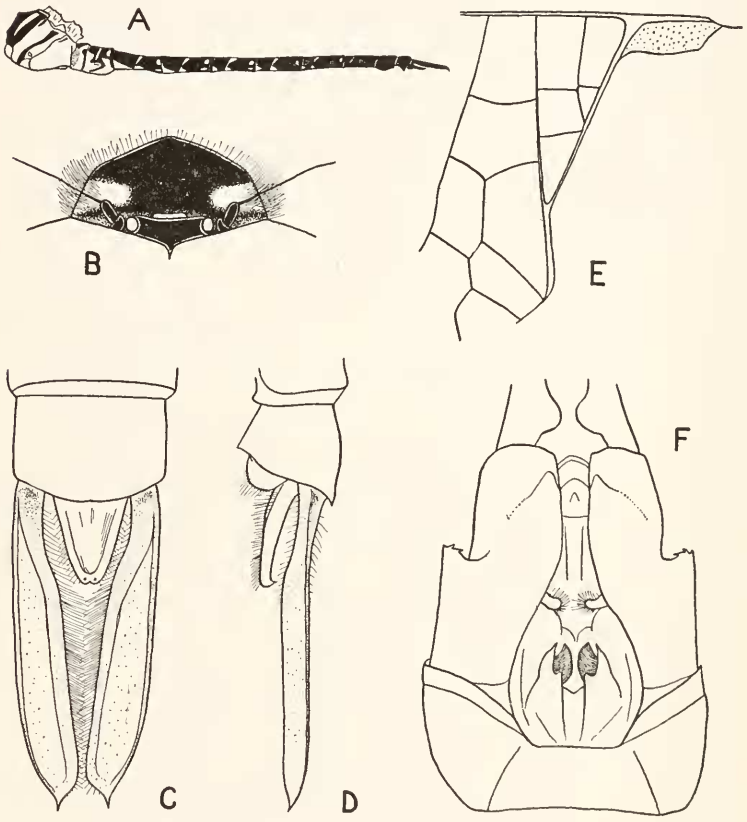

Fig. 1. *Coryphaeschna dentata* n. sp. male type. A. Color pattern of thorax and abdomen; B. black T-spot on the frons; C. dorsal view of appendages; D. lateral view of appendages; E. Anal triangle, right wing; F. ventral surface of abdominal segments 1 and 2.

spot to the hind margin. On segm. 6 and 7 the post-lateral spot absent. Segm. 8–10 black. Ventral surface of segm. 3–10 brown, except on segm. 9 where it is largely black with the genital valves yellow.

Appendages: superiors dark brown, inferior black, shining; superiors long lanceolate, flat with an acute pointed hind tip, basal third petiolated, innerside over its entire length beset with long black bristles. Inferior appendage short, broad and flat, the hind tip slightly incised and with two teeth directed upward, reaching caudad to the basal third of the superiors, beset with black bristles on the underside.

Sternites of segm. 1 and 2 without denticles, the end of the ventral edge of pleurite of segm. 2 bristled. The spines of the anterior lamina conical, directed caudad to just behind the anterior hamule. Anterior hamules triangular, the tips directed cephalad; posterior hamules small spatula-shaped, bristled at the anterior margin, the tips rounded and directed medio-caudad.

Wings slightly yellowish-tinged; pterostigma brown, membranule unicolorous gray. Fork of *Rs* in front wing at the level of one postnodal cell before the stigma, in hind wing 4 postnodal cells before the stigma. Fork of *Rs* enclosing 3–4 cell rows under the middle of stigma. *Rs–Rspl* very broad, from the beginning of furcation of *Rs* 6–7 cells broad; M_4–*Mspl* broad, in the middle 4–5 cells broad; between M_3 and M_4 in the apical half 2 cell rows; M_4 forked in the hind wing, anal branch dilating and farther on parallel to M_3, with 2 cell rows between M_3 and M_4. Triangle long, in front and hind wing with a proximal longitudinal vein (in left front wing with two such veins) and 5 cross veins, number of cells in t 9.8/7.7; cubito-anal cross veins 6.7/5.5, ht 8.7/5.7 ti with one cross vein (left fr.w. with two cross veins). Anal loop with 3 cell rows against A, in total with 10–11 cells; between anal loop and hind margin of wing 2 cell rows; anal field in maximum 3 cell rows broad, anal triangle in left hind wing with 4, in right hind wing with 5 cells (see fig. 2, E). Number of antenodal cross veins (between costa and subcosta) 28.28/18.17, second thickened vein at 9.9/7.6; postnodal cross veins

17.19/22.21. There is one subbasal cross vein before the first thickened vein in the right front wing. Front wing with arculus between ant. crossv. 2 and 3 (left side), 3 and 4 (right side), in hind wing between 2 and 3.

SURINAM, Paloemeu River near Indian village Julu (Joeloe), 3. I, 1941 one male ad. (L. Schmidt) *holotype,* in the writer's collection.

This species belong to the *castor*-group by the position of the fork of *Rs* before the stigma and by the longitudinal vein at the proximal side of t. It is a near relative of *coronata* Ris, from which it differs however, beside the points mentioned in the key, in the wing venation as follows:

	coronata	*dentata*
Number of cell rows between Rs–Rspl	5	6–7
" " " " " M_4–Mspl	3*	4–5
" " " " in anal loop	2	3
Internal triangle	free	1–2 cross veins
Anal triangle	2-celled	4–5 celled

CORYPHAESCHNA VIRENS, Rambur, Nymph (hitherto unknown), reared, Fig. 2, A–F.

A long slender pale light brown or black nymph.

Head as long as broad, the eyes not very prominent, hind lobes flat, hind angles right-angled or nearly so, occipital border slightly excavated. Sides of hind lobes straight, diverging cephalad slightly, about half as long as the eyes.

Antenna minute, seven-jointed, the first two segments swollen, the remaining part slender, the fourth joint the shortest; length of the segments: 0.45, 0.45, 0.74, 0.37, 0.53, 0.57, 0.53 mm.; apical end of segm. 3 and the basal three-fourths of segm. 4 and the middle part of segm. 7 darker, otherwise pale, segm. 2 hairy.

Mentum very long, reaching backward to the beginning of the hind coxae, basal two-thirds slender, length: width = 7 : 2;

[* In a male of *coronata* from Satipo, Peru, 14 November, 1940, *M_4–Mspl* has three rows of cells on both front wings and the right hind wing, 4 rows on the left hind wing, 3 vertical rows of cells in the anal loop of both hind wings.—P. P. Calvert.]

apical third considerably dilated, median border with a small cleft in the middle, on each side a long sharp-pointed tooth. Lateral lobes short, the movable hook very long, curved, with a row of short spines interiorly; terminal hook long, pointed, curved inward at an angle of about 100°, inner margin of lobe and front part of terminal hook finely crenulated.

Maxillae each with seven large teeth.

Mandibulae with strong teeth, left mandibula with 4 apical teeth (incisors), right mandible with 5 apical teeth; more basally a highly chitinized rib (molar) on either side with one tooth (left mandible) or on one side one tooth and on the other side two teeth (right mandible).

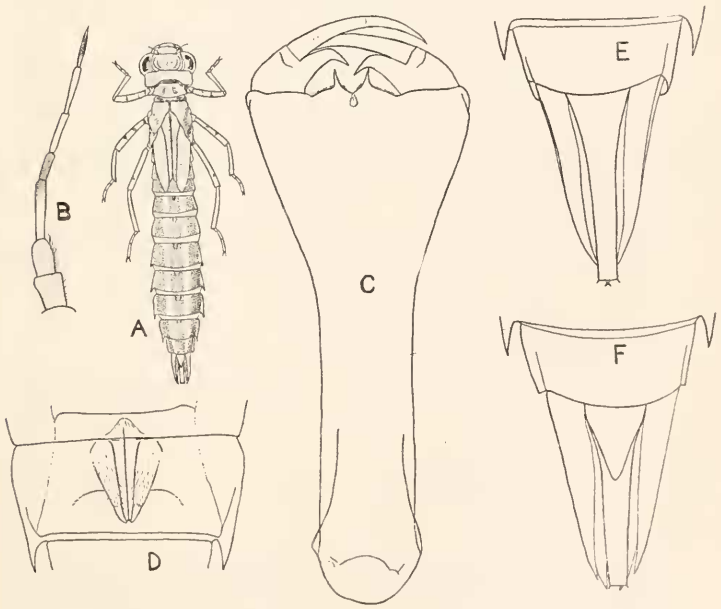

FIG. 2. *Coryphaeschna virens* Rambur. A. dorsal view of full grown male nymph; B. right antenna; C. mentum, innerside; D. gonapophyses, female; E. dorsal view of abdominal appendages of female; F. idem of male.

Prothorax broad, lateral angle of middle lobe bluntly pointed; supracoxal prominences minute, the frontal lobe smaller than the caudal lobe. Synthorax small, wingpads reaching to the beginning of abd. segm. 4. Legs relatively short; in the darker specimens four darker bands on the femora, or three lighter bands and a basal dark band on the tibiae. Apical end of tibiae beset with short thick simple spines and trident setae, tarsus first joint with simple and some trident setae, on second and third joints trident setae only.

Abdomen slender, broadest on segm. 6–8; a middorsal darker band (in the paler specimens diffuse) and on each side a broad darker band above the carinae; in the darkest specimens the whole abdomen black; lateral spines on segm. 6–9, those of segm. 6 minute. Female gonapophyses short, not reaching the end of segm. 9.

Appendages long and all of nearly equal length; tip of middorsal squarely truncate, not bifid; dorso-laterals (cercoids) slender, sharp pointed, as long as middorsal; ventrals (cerci) a little longer the pointed tips slightly curved inward; male triangle reaching to one third the length of the middorsal appendage.

♂. Total length 47 mm.; abd. + app. 33.5 mm.; appendages 4.2 mm.; hind femur 7.5 mm.; mentum 13 mm.; abd. widest segm. (6) 7 mm.; width of head across the eyes 8 mm.; across the hind angles 5.5 mm.

♀. Total length 49 mm.; abd. + app. 33 mm.; appendages 4.2–5 mm.; hind femur 7 mm.; mentum 13.5–14 mm.; abd. widest segm. (6) 7.5–8 mm.; width of head across the eyes 8.2 mm.; across the hind angles 5.7–6 mm.

(Examined one male and one female ult nymph and one male and 8 female exuviae).

The nymphs of *C. virens* were commonly found in swamps and ditches in the coastland and in the interior on the savanna (Paramaribo, Lelydorp, Zandery I and II, Nickerie). Six specimens have been reared, two from the 5 ult, two from the 4 ult and two from the 3 ult instar. The younger nymphs are green with a yellow middorsal stripe. Of the reared speci-

mens, the moulting dates and the number of days in the different instars are tabulated in the following:

	locality	collected	5 ult days	5 ult moulting	4 ult days	4 ult moulting	3 ult days	3 ult moulting	2 ult days	2 ult moulting	1 ult days	1 ult moulting	imago sex
No. 1	Lelydorp	17.VII.1940	(6)	23.VII	7	30.VII	8	7.VIII	17	24.VIII	26	19.IX	female
No. 2	Lelydorp	17.VII.1940			(11)	28.VII	10	7.VIII	17	24.VIII	26	19.IX	female
No. 3	Lelydorp	17.VII.1940			(13)	30.VII	10	9.VIII	15	24.VIII	28	21.IX	female
No. 4	Lelydorp	31.VII.1940					(5)	5.VIII	21	26.VIII	29	24.IX	female
No. 5	Paramaribo	5.II.1941					(12)	17.II	36	25.III	22	16.IV	male
No. 6	Zanderij I	27.V.1941	(16)	12.VI	4	16.VI	10	26.VI	25	21.VII	52	11.IX	female

It is noteworthy, that the number of days for the instars are very inconstant among the reared specimens. The specimens are all bred at the same place in the laboratory and constantly fed with mosquito larvae. Nymphs of *Coryphaeschna* have been described by Kennedy (1919) and Byers (1930) for *C. ingens*. This nymph differs from those of *C. virens* only in the measurements. Total length of *ingens:* 62–65 mm.; abd. 42.5–44 mm.; hind femur 6.5–8 mm.; width of abdomen 10 mm.; mentum 14.5 mm.; extending well below the metacoxae.

Garcia Diaz (1938) has described by supposition the nymph of *Coryphaeschna adnexa* Hagen, but this is the nymph of *Gynacantha nervosa* Ramb. as suggested also by himself (p. 85), known to me by breeding.

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New Hesperioidea, with Notes on Some Others from the United States (Lepidoptera, Rhopalocera).

By H. A. FREEMAN, White Deer, Texas

Thorybes pylades albosuffusa new form

This new form differs from typical *pylades* (Scudder) in the following particulars: on the under surface of the secondaries there is a prominent submarginal suffusion of greyish-white scales. In *pylades* this is not present or else is very faintly indicated. The fringe of the secondaries is lighter than that of *pylades* caused by the presence of some white scales. The palpi beneath are grey and not concolorous with the under surface of the body. In *pylades* the palpi are concolorous with the under surface of the body.

Described from 5 specimens, 2 males and 3 females, collected by Mrs. H. A. Freeman and the author at Ft. Davis (type locality) and Alpine, TEXAS, during June of 1940 and 1942.

Holotype male and *allotype* female are in the collection of the author. *Paratypes,* 1 male and 2 females, will be disposed as follows: 1 male to the United States National Museum; and 1 female to the Academy of Natural Sciences, Philadelphia. The other female paratype will remain for the present in the collection of the author.

Although it is not always advisable to name forms of most species of butterflies, occasionally one appears that causes difficulty in correctly determining the species. The writer believes